

# Addressing Emerging Contaminants in Massachusetts

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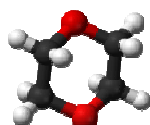
## Acknowledgements

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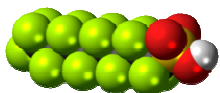
## Presentation Overview

- Why Address Emerging Contaminants?
- MassDEP's Emerging Contaminants Workgroup
- A Few Examples
- A Quick Recap
- Questions/Discussion



1,4-Dioxane

## Why Address Emerging Contaminants?



perfluorooctane sulfonate (PFOS)



Perfluorooctanoic acid (PFOA),



## **“The EC Challenge” by the Numbers**

- CAS REGISTRY<sup>SM</sup> contains more than 112 million unique organic and inorganic chemical substances
- ~80,000 in use (GAO, 1994)
- > 70,000 chemicals in commercial use (TSCA inventory, 2001)
- Changing universe: approximately 15,000 new substances are added each day to CAS Registry.
- 650+ chemicals in EPA’s TRI list (EPA, 2015)
- 1,232 “CAS #s” listed in MOHML (MCP, Subpart P).....



## **Key EC Issues**

- Increasingly sensitive instrumentation
- Data gaps: toxicity; occurrence; sources
- Sensitive groups; developmental risks
- Many EC-specific confounding sources
- Evolving science & technology
- Technical, programmatic and business challenges abound
- So what do we focus on?



# MassDEP's Emerging Contaminants Workgroup



## The Evolution of the MassDEP EC WG

- **Pre-2000:** MA TURA (1989) and EPA's SDWA UCMR program
- **Late 1990s:** Perchlorate in Bourne DW triggered Perchlorate WG and assessment. Developmental toxicity issues elevated concern.
- **2001:** Statewide PWS testing/policy development
- **2006:** MA perchlorate drinking water and GW-1 cleanup standard (2  $\mu\text{g/L}$ )
  - BMPs developed for non-MCP release scenarios
- **2007:** **Perchlorate WG -> Emerging Contaminants WG**



## MassDEP's EC Workgroup

- Mission: "to centralize MassDEP's focus on EC, foster information exchange and bring together a broad range of cross-program expertise"
- Goals include:
  - Increasing readiness by identifying new potential public health and environmental problems early on
  - Information sharing/coordination across programs/media
  - EC screening
  - Assist on EC-specific strategies to protect human health
- ORS Lead; senior managers; BSWC; BAW; BWR; Regional Offices; WES; DPH

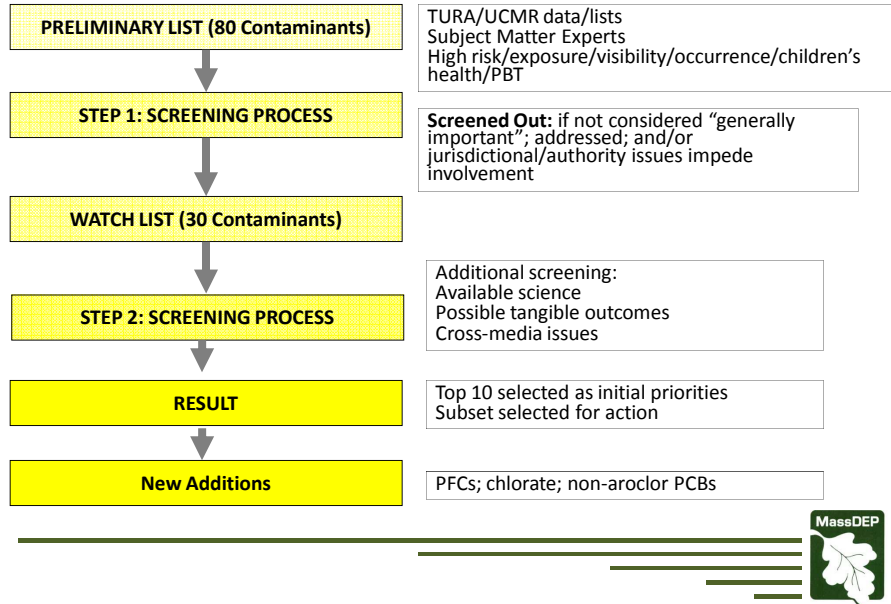


## Task 1 – MassDEP EC Definition

- ECs defined as hazardous chemicals, biological agents, or radiological substances that:
  - Present threats to human health, public safety or the environment;
  - Lack national health standards/guidelines;
  - Have toxicological information that is limited, evolving or being re-evaluated; or
  - Have significant new source, pathway or detection limit information
- May include naturally occurring or manmade chemicals



## Task 2 – MassDEP EC Screening Process



## Task 3 – Develop MassDEP EC Lists (2007- 2015)

### Watchlist ECs:

- Several VOC's
- Detergents
- Disinfectants
- Plasticizers
- Pesticides
- DEET (insect repellent)  
(part of PPCP/EDC)

### Priority ECs:

- Perchlorate<sup>1</sup>
- 1,4-Dioxane (UCMR-3)<sup>1</sup>
- Tetrachloroethylene (PCE)<sup>1</sup>
- Trichloroethylene (TCE)<sup>1</sup>
- RDX<sup>1</sup>
- Tungsten<sup>1</sup>
- Cyanotoxins
- Nanoparticles
- PolyBrominated Diphenyl Ethers (PBDEs)
- PPCP

### New:

- PFCs (including PFOS/PFOA);  
chlorate (UCMR-3); non-aroclor  
PCBs?

<sup>1</sup> MCP Promulgated Standard(s) have been derived/revised since initial inclusion in EC list.



## A FEW EXAMPLES



### ***SDWA UCMR-Related ECs (Assisting Communities With Drinking Water Issues)***

- “Contaminants suspected to be present in drinking water but that do not have EPA promulgated drinking water standards” (EPA SDWA’s 3<sup>rd</sup> UCMR Rule, UCMR3)
- Pose potential threats to human health, analytical and treatability challenges.
- Recent examples of ECs:
  - **PFCs (PFOS & PFOA); chlorate**
- Assisting communities with sampling, risk communication outreach, assessing sources, treatment options



## Perflourinated Chemicals:

(PFCs , including PFOS & PFOA)

<b>MassDEP EC Triggers</b>	Toxicity; widespread; no standards; persistent; children health risks.
<b>Uses &amp; Sources</b>	Stain, water and grease resistant. Used in many products, some industrial applications ; in fire fighting foams. Potential areas of concern: fire-fighting foam use: tanker spills, military bases, airfields; industrial facilities; septic systems.
<b>Health Impacts / Risk Reduction Strategies</b>	Developmental toxicity. EPA DW HAs lowered last week for PFOS and PFOA (200 and 400 ppt to 70 ppt combined).  Alternative Water Provision, Blending, GAC.
<b>MassDEP and EC WG Focus</b>	Information sharing coordination across Bureaus; assisting communities



## PFC Drinking Water Case

- Hyannis Public Water Supply
  - PFCs elevated in some wells: met previous HA exceeded new lower HA
  - Treatment, well closure, blending with water from neighboring community
  - Expedited public notice





## ***Trichloroethylene (TCE) (Addressing Imminent Hazards)***

- Well established VOC contaminant, *but....*
- New toxicity data raised concerns about serious fetal developmental effects
- Extensive effort to evaluate the data and update MCP standards/imminent hazard requirements
- BWSC implementing



## ***Pharmaceutical and Personal Care Products / Endocrine Disruptors (Research and Enhanced P2)***

- 71% increase in use compared to US pop. growth of 9% (1994 – 2005)
- Detected downstream of WWTPs & in septic tank effluent
  - Documented detections 30 states, 139 streams (USGS, 2002)
- Endocrine disruptor effects
  - Some may mimic/block normal hormonal functioning
  - Potential reproductive, developmental, and/or behavioral effects
- EC WG Focus
  - Detection & Occurrence Research (DEP/UMass/Private-Muni Partnership)
  - Pollution Prevention (Pharma take-back programs)
  - Drop-off kiosks / Centers (DEA, DPH and DEP-regulated)
- Continued Awareness & Assessment (Public Outreach)



## **“Takeaways”**

- MassDEP using broad definition of ECs
- Addressing a small subset of possible ECs
- Key criteria considered in EC ID and ranking:
  - Threat to human health, public safety, environment;
  - Lack national health standards/guidelines
  - Evolving information on toxicity, exposure potential, sources
  - Risks to children
  - Widespread
  - Persistence
- EC Workgroup identifies, tracks, prioritizes, mechanism to share information
- Representatives from across DEP and now DPH
- Latest ECs: PFCs; chlorate (non-arochlor PCBs?)

